IN THE CLAIMS

Please replace pending claims 1 and 2 with amended claims 1 and 2 as follows:

1. (Once Amended) A temperature control system for an inkjet printhead assembly, comprising:

a printhead assembly having ink ejection elements energizable by an electrical pulse having an amplitude and pulse width;

a sensor coupled to the printhead assembly for generating a signal representative of the printhead temperature;

a memory for storing current printhead operating parameters, a thermal response model of the printhead and an ejection history of the ejection elements that defines a dynamic estimate of the temperature distribution across the printhead; and

a controller for reading a nominal operating pulse width, the signal from the sensor, the dynamic estimate and the printhead operating parameters, said controller calculates an adjusted pulse width using the nominal operating pulse width, the signal from the sensor and the current printhead operating parameters;

wherein the controller uses the adjusted pulse width to control printhead temperature.

2. (Once Amended) A method of controlling the temperature of an inkjet printhead comprising:

reading a nominal printhead operating temperature;

obtaining a thermal response model of the printhead and an ejection history of the ejection elements that defines a dynamic estimate of the temperature distribution across the printhead and a current printhead operating temperature using a sensor on the printhead;

controlling the temperature of the printhead using the dynamic estimate and the measured temperature of the printhead.

Please add new claims 3-22

3. (New) The temperature control system of claim 1 wherein the controller is located on at least one of the printhead or externally on a printer.

4. (New) The temperature control system of claim 1 wherein the controller reads the nominal operating pulse width and the pulse width calibration data from a memory located on the printhead assembly.

5. (New) The temperature control system of claim 1 wherein the controller reads the nominal operating pulse width and the pulse width calibration data from a memory located on the printer.

6. (New) The temperature control system of claim 1 wherein the temperature sensor is an analog temperature sensor.

7. (New) The temperature control system of claim 6 further including an analog to digital converter for generating a digital format of the measured analog signal.

8. (New) The temperature control system of claim 1 wherein the temperature sensor is a digital temperature sensor.

9. (New) The temperature control system of claim 1 wherein the temperature sensor includes multiple temperature sensors distributed around the printhead so as to provide a global measurement of the printhead temperature.

10. (New) The temperature control system of claim 1 wherein the pulse width calibration data is in the form of an equation.

11. (New) The temperature control system of claim 1 wherein the pulse width calibration data is in a look-up table.

12. (New) A method of controlling the temperature of an inkjet printhead having ink ejection elements energizable by an electrical pulse having an amplitude and pulse width, comprising:

reading a nominal printhead operating temperature, a nominal operating pulse width and pulse width calibration data;

obtaining a thermal response model of the printhead and an ejection history of the ejection elements that defines a dynamic estimate of the temperature distribution across the printhead and a current printhead operating temperature using a sensor on the printhead;

determining a pulse width adjustment factor based on the pulse width calibration data, the dynamic estimate and the measured temperature of the printhead;

calculating an adjusted operating pulse width based on the pulse width adjustment factor and the nominal operating pulse width; and

applying the adjusted operating pulse width to the printhead to control printhead temperature.

13. (New) The method of controlling the temperature of claim 12 wherein the controller is located on the printhead.

14. (New) The method of controlling the temperature of claim 12 wherein the controller is located on a printer.

15. (New) The method of controlling the temperature of claim 12 wherein the controller reads the nominal operating pulse width and the pulse width calibration data from a memory located on the printhead assembly.

16. (New) The method of controlling the temperature of claim 12 wherein the controller reads the nominal operating pulse width and the pulse width calibration data from a memory located on the printer.

17. (New) The method of controlling the temperature of claim 12 wherein the temperature sensor is an analog temperature sensor.

18. (New) The method of controlling the temperature of claim 17 further including an analog to digital converter for generating a digital format of the measured analog signal.

19. (New) The method of controlling the temperature of claim 12 wherein the temperature sensor is a digital temperature sensor.

20. (New) The method of controlling the temperature of claim 12 wherein the temperature sensor includes multiple temperature sensors distributed around the printhead so as to provide a global measurement of the printhead temperature.

21. (New) The method of controlling the temperature of claim 12 wherein the pulse width calibration data is in the form of an equation.

22. (New) The method of controlling the temperature of claim 12 wherein the pulse width calibration data is in a look-up table.